

**WE CLAIM**

What is claimed is:

- 1           1.       A method for inhibiting the corrosion of metals embedded in a cementitious  
2 material, said cementitious material manufacturable from a process comprising the  
3 activities of:  
4           manufacturing lithium nitrate; and  
5           providing said lithium nitrate for addition to said cementitious material at an  
6 effective dosage rate.
- 1           2.       The method of claim 1, wherein said effective dosage rate is between about  
2 0.01 gram moles of lithium nitrate per cubic foot of cementitious material and about 100  
3 gram moles of lithium nitrate per cubic foot of cementitious material.
- 1           3.       The method of claim 1, wherein said effective dosage rate is between about  
2 0.01 gram moles of lithium nitrate per cubic foot of cementitious material and about 0.1  
3 gram moles of lithium nitrate per cubic foot of cementitious material.
- 1           4.       The method of claim 1, wherein said effective dosage rate is between about  
2 0.1 gram moles of lithium nitrate per cubic foot of cementitious material and about 1 gram  
3 moles of lithium nitrate per cubic foot of cementitious material.
- 1           5.       The method of claim 1, wherein said effective dosage rate is between about  
2 1 gram moles of lithium nitrate per cubic foot of cementitious material and about 10 gram  
3 moles of lithium nitrate per cubic foot of cementitious material.
- 1           6.       The method of claim 1, wherein said effective dosage rate is between about  
2 10 gram moles of lithium nitrate per cubic foot of cementitious material and about 100  
3 gram moles of lithium nitrate per cubic foot of cementitious material.

1           7.       The method of claim 1, wherein said effective dosage rate is about 0.815  
2 gram moles of lithium nitrate per cubic foot of cementitious material.

1           8.       The method of claim 1, wherein said lithium nitrate is provided as a solid.

1           9.       The method of claim 1, wherein said lithium nitrate is provided in an  
2 aqueous solution.

1           10.      The method of claim 1, wherein said cementitious material is concrete.

1           11.      The method of claim 1, wherein said cementitious material is grout.

1           12.      The method of claim 1, wherein said cementitious material is mortar.

1           13.      The method of claim 1, wherein said cementitious material is pozzalanic  
2 cement.

1           14.      The method of claim 1, wherein said cementitious material is at least one of  
2 cement, grout, mortar, and pozzalanic cement, or any combination thereof.

1           15.      A method for inhibiting the corrosion of metals embedded in concrete or  
2 any other cementitious material, said concrete or cementitious material manufacturable  
3 from a process comprising the activities of:  
4           obtaining lithium nitrate; and  
5           mixing said lithium nitrate with said concrete or cementitious material at an  
6 effective dosage rate.

1           16.      The method of claim 15, wherein said effective dosage rate is between

2 about 0.01 gram moles of lithium nitrate per cubic foot of concrete or cementitious  
3 material and about 100 gram moles of lithium nitrate per cubic foot of concrete or  
4 cementitious material.

1 17. The method of claim 15, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of concrete or cementitious  
3 material and about 0.1 gram moles of lithium nitrate per cubic foot of concrete or  
4 cementitious material.

1 18. The method of claim 15, wherein said effective dosage rate is between  
2 about 0.1 gram moles of lithium nitrate per cubic foot of concrete or cementitious material  
3 and about 1 gram moles of lithium nitrate per cubic foot of concrete or cementitious  
4 material.

1 19. The method of claim 15, wherein said effective dosage rate is between  
2 about 1 gram moles of lithium nitrate per cubic foot of concrete or cementitious material  
3 and about 10 gram moles of lithium nitrate per cubic foot of concrete or cementitious  
4 material.

1 20. The method of claim 15, wherein said effective dosage rate is between  
2 about 10 gram moles of lithium nitrate per cubic foot of concrete or cementitious material  
3 and about 100 gram moles of lithium nitrate per cubic foot of concrete or cementitious  
4 material.

1 21. The method of claim 15, wherein said effective dosage rate is about 0.815  
2 gram moles of lithium nitrate per cubic foot of concrete or cementitious material.

1 22. A method for inhibiting the corrosion of metals embedded in grout, said

2 grout manufacturable from a process comprising the activities of:

3 obtaining lithium nitrate; and

4 mixing said lithium nitrate with said grout at an effective dosage rate.

1 23. The method of claim 22, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of grout and about 80 gram moles  
3 of lithium nitrate per cubic foot of grout.

1 24. The method of claim 22, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of grout and about 82 gram moles  
3 of lithium nitrate per cubic foot of grout.

1 25. The method of claim 22, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of grout and about 100 gram moles  
3 of lithium nitrate per cubic foot of grout.

1 26. The method of claim 22, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of grout and about 0.1 gram moles  
3 of lithium nitrate per cubic foot of grout.

1 27. The method of claim 22, wherein said effective dosage rate is between  
2 about 0.1 gram moles of lithium nitrate per cubic foot of grout and about 1 gram moles of  
3 lithium nitrate per cubic foot of grout.

1 28. The method of claim 22, wherein said effective dosage rate is between  
2 about 1 gram moles of lithium nitrate per cubic foot of grout and about 10 gram moles of  
3 lithium nitrate per cubic foot of grout.

1 29. The method of claim 22, wherein said effective dosage rate is between

2 about 10 gram moles of lithium nitrate per cubic foot of grout and about 100 gram moles  
3 of lithium nitrate per cubic foot of grout.

1 30. The method of claim 22, wherein said effective dosage rate is about 0.815  
2 gram moles of lithium nitrate per cubic foot of grout.

1 31. A method for inhibiting the corrosion of metals embedded in mortar, said  
2 mortar manufacturable from a process comprising the activities of:  
3 obtaining lithium nitrate; and  
4 mixing said lithium nitrate with said mortar at an effective dosage rate.

1 32. The method of claim 31, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of mortar and about 80 gram moles  
3 of lithium nitrate per cubic foot of mortar.

1 33. The method of claim 31, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of mortar and about 82 gram moles  
3 of lithium nitrate per cubic foot of mortar.

1 34. The method of claim 31, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of mortar and about 100 gram  
3 moles of lithium nitrate per cubic foot of mortar.

1 35. The method of claim 31, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of mortar and about 0.1 gram  
3 moles of lithium nitrate per cubic foot of mortar.

1 36. The method of claim 31, wherein said effective dosage rate is between  
2 about 0.1 gram moles of lithium nitrate per cubic foot of mortar and about 1 gram moles of

3 lithium nitrate per cubic foot of mortar.

1           37.     The method of claim 31, wherein said effective dosage rate is between  
2 about 1 gram moles of lithium nitrate per cubic foot of mortar and about 10 gram moles of  
3 lithium nitrate per cubic foot of mortar.

1           38.     The method of claim 31, wherein said effective dosage rate is between  
2 about 10 gram moles of lithium nitrate per cubic foot of mortar and about 100 gram moles  
3 of lithium nitrate per cubic foot of mortar.

1           39.     The method of claim 31, wherein said effective dosage rate is about 0.815  
2 gram moles of lithium nitrate per cubic foot of mortar.

1           40.     A method for inhibiting the corrosion of metals embedded in cementitious  
2 material, said cementitious material manufacturable from a process comprising the  
3 activities of:  
4           obtaining lithium nitrate; and  
5           applying said lithium nitrate to the surface of said cementitious material at an  
6 effective dosage rate.

1           41.     The method of claim 40, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of cementitious material and about  
3 100 gram moles of lithium nitrate per cubic foot of cementitious material.

1           42.     The method of claim 40, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of cementitious material and about  
3 0.10 gram moles of lithium nitrate per cubic foot of cementitious material.

1           43.     The method of claim 40, wherein said effective dosage rate is between

2 about 0.1 gram moles of lithium nitrate per cubic foot of cementitious material and about 1  
3 gram moles of lithium nitrate per cubic foot of cementitious material.

1 44. The method of claim 40, wherein said effective dosage rate is between  
2 about 1 gram moles of lithium nitrate per cubic foot of cementitious material and about 10  
3 gram moles of lithium nitrate per cubic foot of cementitious material.

1 45. The method of claim 40, wherein said effective dosage rate is between  
2 about 10 gram moles of lithium nitrate per cubic foot of cementitious material and about  
3 100 gram moles of lithium nitrate per cubic foot of cementitious material.

1 46. The method of claim 40, wherein said effective dosage rate is about 0.815  
2 gram moles of lithium nitrate per cubic foot of cementitious material.

1 47. A method for inhibiting the corrosion of metals in embedded in  
2 cementitious material, said cementitious material manufacturable from a previously heated  
3 Portland cement composition, said Portland cement manufacturable from a process  
4 comprising the activities of:  
5 obtaining lithium nitrate; and  
6 admixing said lithium nitrate with said Portland cement composition at an effective  
7 dosage rate.

1 48. The method of claim 47, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of cement and about 100 gram  
3 moles of lithium nitrate per cubic foot of cement.

1 49. The method of claim 47, wherein said effective dosage rate is between  
2 about 0.01 gram moles of lithium nitrate per cubic foot of cement and about 0.1 gram  
3 moles of lithium nitrate per cubic foot of cement.

1           50.     The method of claim 47, wherein said effective dosage rate is between  
2 about 0.1 gram moles of lithium nitrate per cubic foot of cement and about 1 gram moles  
3 of lithium nitrate per cubic foot of cement.

1           51.     The method of claim 47, wherein said effective dosage rate is between  
2 about 1 gram moles of lithium nitrate per cubic foot of cement and about 10 gram moles of  
3 lithium nitrate per cubic foot of cement.

1           52.     The method of claim 47, wherein said effective dosage rate is between  
2 about 10 gram moles of lithium nitrate per cubic foot of cement and about 100 gram moles  
3 of lithium nitrate per cubic foot of cement.

1           53.     The method of claim 47, wherein said effective dosage rate is about 0.815  
2 gram moles of lithium nitrate per cubic foot of cement.

1           54.     A method for inhibiting the corrosion of metals embedded in cementitious  
2 material, said cementitious material comprising a Portland cement composition, said  
3 Portland cement composition creatable from a method comprising the activities of:  
4           obtaining lithium nitrate;  
5           admixing said lithium nitrate with said Portland cement in an amount sufficient to  
6 inhibit the corrosion of metals; and  
7           heating said material to form a Portland cement clinker.

1           55.     The method of claim 54, wherein said sufficient amount provides a molar  
2 ratio of lithium to sodium equivalent in the resultant cement clinker of between about  
3 0.01:1 to about 10:1.



1           56.     The method of claim 54, wherein said sufficient amount provides a molar  
2 ratio of lithium to sodium equivalent in the resultant cement clinker of between about  
3 0.01:1 to about 0.1:1.

1           57.     The method of claim 54, wherein said sufficient amount provides a molar  
2 ratio of lithium to sodium equivalent in the resultant cement clinker of between about 0.1:1  
3 to about 1:1.

1           58.     The method of claim 54, wherein said sufficient amount provides a molar  
2 ratio of lithium to sodium equivalent in the resultant cement clinker of between about 1:1  
3 to about 5:1.

1           59.     The method of claim 54, wherein said sufficient amount provides a molar  
2 ratio of lithium to sodium equivalent in the resultant cement clinker of between about 5:1  
3 to about 10:1.

1           60.     A composition comprising:  
2 a concrete or cementitious material comprising between about 0.01 gram moles of  
3 lithium nitrate per cubic foot of concrete to about 100 gram moles of lithium nitrate per  
4 cubic foot of concrete or cementitious material.

1           61.     The composition of claim 60, wherein said concrete or cementitious  
2 material comprises between about 0.01 gram moles of lithium nitrate per cubic foot of  
3 concrete to about 0.1 gram moles of lithium nitrate per cubic foot of concrete or  
4 cementitious material.

1           62.     The composition of claim 60, wherein said concrete or cementitious  
2 material comprises between about 0.1 gram moles of lithium nitrate per cubic foot of  
3 concrete to about 1 gram moles of lithium nitrate per cubic foot of concrete.

1           63.     The composition of claim 60, wherein said concrete or cementitious  
2 material comprises between about 1 gram moles of lithium nitrate per cubic foot of  
3 concrete to about 10 gram moles of lithium nitrate per cubic foot of concrete or  
4 cementitious material.

1           64.     The composition of claim 60, wherein said concrete or cementitious  
2 material comprises between about 10 gram moles of lithium nitrate per cubic foot of  
3 concrete to about 100 gram moles of lithium nitrate per cubic foot of concrete or  
4 cementitious material.

1           65.     The method of claim 60, wherein said concrete or cementitious material  
2 comprises about 0.815 gram moles of lithium nitrate per cubic foot of grout or  
3 cementitious material.

1           66.     A composition comprising:  
2                 a grout comprising between about 0.01 gram moles of lithium nitrate per cubic foot  
3 of grout to about 100 gram moles of lithium nitrate per cubic foot of grout.

1           67.     The composition of claim 66, wherein said grout comprises between about  
2 0.01 gram moles of lithium nitrate per cubic foot of grout and about 80 gram moles of  
3 lithium nitrate per cubic foot of grout.

1           68.     The composition of claim 66, wherein said grout comprises between about  
2 0.01 gram moles of lithium nitrate per cubic foot of grout and about 82 gram moles of  
3 lithium nitrate per cubic foot of grout.

1           69.     The method of claim 66, wherein grout comprises between about 0.01 gram  
2 moles of lithium nitrate per cubic foot of grout and about 0.1 gram moles of lithium nitrate

3 per cubic foot of grout.

1 70. The method of claim 66, wherein said grout between about 0.1 gram moles  
2 of lithium nitrate per cubic foot of grout and about 1 gram moles of lithium nitrate per  
3 cubic foot of grout.

1 71. The method of claim 66, wherein said grout comprises between about 1  
2 gram moles of lithium nitrate per cubic foot of grout and about 10 gram moles of lithium  
3 nitrate per cubic foot of grout.

1 72. The method of claim 66, wherein said grout comprises between about 10  
2 gram moles of lithium nitrate per cubic foot of grout and about 100 gram moles of lithium  
3 nitrate per cubic foot of grout.

1 73. The method of claim 66, wherein said grout comprises about 0.815 gram  
2 moles of lithium nitrate per cubic foot of grout.

1 74. A composition comprising:  
2 a mortar comprising between about 0.01 gram moles of lithium nitrate per cubic  
3 foot of mortar to about 100 gram moles of lithium nitrate per cubic foot of mortar.

1 75. The composition of claim 74, wherein said mortar comprises between about  
2 0.01 gram moles of lithium nitrate per cubic foot of mortar and about 80 gram moles of  
3 lithium nitrate per cubic foot of mortar.

1 76. The composition of claim 74, wherein said mortar comprises between about  
2 0.01 gram moles of lithium nitrate per cubic foot of mortar and about 82 gram moles of  
3 lithium nitrate per cubic foot of mortar.

1           77.     The method of claim 74, wherein mortar comprises between about 0.01  
2     gram moles of lithium nitrate per cubic foot of mortar and about 0.1 gram moles of lithium  
3     nitrate per cubic foot of mortar.

1           78.     The method of claim 74, wherein said mortar between about 0.1 gram  
2     moles of lithium nitrate per cubic foot of mortar and about 1 gram moles of lithium nitrate  
3     per cubic foot of mortar.

1           79.     The method of claim 74, wherein said mortar comprises between about 1  
2     gram moles of lithium nitrate per cubic foot of mortar and about 10 gram moles of lithium  
3     nitrate per cubic foot of mortar.

1           80.     The method of claim 74, wherein said mortar comprises between about 10  
2     gram moles of lithium nitrate per cubic foot of mortar and about 100 gram moles of  
3     lithium nitrate per cubic foot of mortar.

1           81.     The method of claim 74, wherein said mortar comprises about 0.815 gram  
2     moles of lithium nitrate per cubic foot of mortar.

1           82.     A composition comprising:  
2             a cementitious material comprising an effective amount lithium nitrate per cubic  
3     foot of cementitious material for inhibiting the corrosion of metals embedded in  
4     cementitious material.